

Bentham's *A. flexicaulis* was not questioned. It is now found, however, that flowering specimens collected by Gregg, evidently our *Pithecolobium*, were named *Acacia flexicaulis* by Bentham, certainly without a careful examination of the flowers; and that the original specimens of Berlandier, from Tamaulipas, were flowerless. It seems safe to conclude that all that has ordinarily been called *Acacia flexicaulis* must be referred to *Pithecolobium Texense*; and its recent discovery by Dr. Palmer at La Paz extends its range through Southern Texas and Northern Mexico to the western side of the continent. In the absence of flowering specimens from Berlandier's locality it is hardly safe to conclude that Bentham's original *A. flexicaulis* of necessity must be our *Pithecolobium*. If this can be proved, the long known specific name could well replace the newer and our plant be known as *P. flexicaule*. It is more prudent, however, to consider that Bentham's original *A. flexicaulis* possibly may prove to be an *Acacia* after all, and to leave it a name and place.

JOHN M. COULTER.

---

## CURRENT LITERATURE.

### A biological survey.

THE *North American Fauna*, No. 3, published by the Division of Ornithology and Mammalogy of the Department of Agriculture, contains a matter of very great interest to botanists. Dr. C. Hart Merriam, the chief of the Division, has felt the necessity of putting the biological exploration of the country upon a thoroughly scientific basis. The patchy collecting and inaccurate noting of localities, which has largely obtained in our exploring expeditions, may be conceded to a vast *terra incognita* such as our western botanists first encountered; but no such concession should be made now, and "collecting trips" should be transformed into "biological surveys." Dr. Merriam has begun the good work by a careful study of the very interesting San Francisco Mountain Region of Arizona, and although his chief concern lay with vertebrate animals, his zones of distribution were necessarily marked out by plant growth, and his results are not only of great botanical interest, but are far more valuable in that they mark out a line of botanical work which the government should at once enter upon and push to its completion. The paper before us not only deals with the biological features of the San Francisco Mountain region, but is also a valuable contribution to the general subject of geographical distribution. This paper should be read by every botanist, and we only append a statement of the most important general results as given by the author: (1) The discovery that there are but two primary life areas in N. Am., a northern (boreal) and a southern (subtropical), both extending completely across the continent and sending off long interpenetrating arms; (2) The consequent abandonment of the three life

areas commonly accepted by naturalists, viz.: the Eastern, Central, and Western Provinces; (3) The recognition of seven minor life zones in the San Francisco Mountain region, four of boreal origin, and three of subtropical or mixed origin; (4) The correlation of the four boreal zones with corresponding zones in the north and east. Colored maps are used to indicate distribution, and the one of most general interest is a provisional biological map of North America.

#### Watson's Contributions.

In looking over the bulky contributions to American botany which issue every year from Cambridge and other botanical centers in this country, it seems that, "of making species there is no end." But so long as new species are found they must be described, and the fascination which attends their discovery will always push this kind of work in a most unflagging way. The "Contribution" before us is Dr. Watson's 17th in this form, appearing in Proc. Am. Acad. xxv. pp. 123-163, and is about as "solid botany" as it could be made, nothing of the list character appearing. The first part consists of miscellaneous notes, many of them being the formal presentation of the reasons for adopting certain changes in the new edition of Gray's Manual. As these changes are already indicated in the Manual, it is not necessary to recount them here. The recognition of 4 new species of *Streptanthus* gives occasion for a synoptical key to all the species, numbering now 22. One of the notable things is the establishment of the genus *Eriogynia*, occasioned by the discovery of a very peculiar Montana species, which also takes with it two species heretofore placed under *Spiræa*, as fully presented and illustrated in the present number of this journal.

The second part is chiefly concerned with Mr. Pringle's Mexican collections of 1888 and 1889, which, as usual, abound in new species. An enumeration of these 88 new species, or any part of them, is impossible in our limited space, but the new genera are important enough to be specially mentioned. *Sargentia* is a new genus of *Rutaceæ*, a tree, and fitly commemorates Professor C. S. Sargent. *Rhodosciadium*, a new genus of Peucedanoid *Umbelliferæ*, has double signification in the color of its flowers and the name of Mr. J. N. Rose, whose long association with the writer in the study of N. Am. *Umbelliferæ* this genus deservedly commemorates. *Jaliscoa* is the third new genus, belonging to the *Eupatoriaceæ*.

#### The "nerves" of the sensitive plant.<sup>1</sup>

IN THIS pamphlet Dr. G. Haberlandt describes what has been a hitherto unobserved system of tissues, to which he gives the untranslatable name of "reizleitende Gewebesystem," by means of which the impulses set up by a stimulus of any sort are propagated in the sensitive plant.

<sup>1</sup>HABERLANDT, G.—Das reizleitende Gewebesystem der Sinnpflanze. 8vo. pp. 87, pl. 3. Leipzig: Wilhelm Englemann. 1890. Mk. 4.

One of the tissues in question is located in the sieve portion of the vascular bundles of the stem, the pulvini, the petioles and the veins. The cells which compose it are very like the sieve cells, but larger, with more or less oblique end walls on which is a single large pit whose closing membrane is traversed by numerous protoplasmic threads. The contents of these cells seems to be a glucoside or some similar body. A nucleus is always present. Another part of the system consists of the sensitive parenchyma of the pulvinus, which is in connection with the collenchyma which surrounds the vascular bundle. There is no direct protoplasmic connection between the protoplasts of the collenchyma and those of the conducting tissue of the bundle.

In the latter part of the work the author discusses the physiology of the sensitive tissue at length. So close and continuous is his discussion that it is not possible to summarize it satisfactorily. While there are still obscure points and some things "hard to be understood," the theory is certainly more satisfactory and open to fewer objections than the present ones.

The name of the publisher, Engelmann, is sufficient guarantee of the excellence of the typography and beauty of the plates.

#### **Cretaceous plants.<sup>2</sup>**

The author presents here a preliminary report upon a collection of fossil plants made by himself and Prof. Lester F. Ward at Martha's Vineyard during the summer 1889. The age of the formation in which these fossils occurred has finally been stated to be Cretaceous, and probably Middle-Cretaceous. Seven or eight species are enumerated and figured, concerning the identification of which a few remarks may be made. As to the figured leaves of *Liriodendron*, it is rather doubtful whether they belong to this genus or not. They agree quite well with figures of similar leaves supposed to belong to this genus, given by other authors, but it seems to have been overlooked that this form of leaf is more characteristic of quite different genera, as for instance *Eucalyptus*, of which several species show the same shape of leaves. They have been found together with some remains of undoubted *Eucalyptus*, and this circumstance seems to speak in favor of the supposition that they should belong to this genus. The author has, however, figured a leaf (fig. 8 on the plate) which he has identified as *Eucalyptus*, but it is very poorly preserved, so that the identification is not without question. When the author calls fruit of *Eucalyptus* "a nut," it is to be pointed out that the fruit of this genus is a capsule, and it is not easy to understand what the author means by his expression "nut with operculum" in the explanation of the plate. These figured remains, supposed to belong to *Eucalyptus*, are not "fruits," but flowerbuds. It is a well-known fact that the calyx in several genera of the *Myrtaceæ* is coherent at the apex, and that it falls off

<sup>2</sup> DAVID WHITE.—On Cretaceous Plants from Martha's Vineyard, with one plate. (From *American Journal of Science*, Vol. XXXIX, 1890.)

like a cap before anthesis, and the author ought to have read the description of similar remains given by Heer in his "Flora fossilis arctica," Vol. VI, pars II, p. 19, where he says: "Ein becherförmiges Körperchen, das lebhaft an die Blüthenknospen von Eucalyptus erinnert." The figured leaves of *Andromeda* and *Myrsine* are so defective that their identification seems rather hazardous.—THEO. HOLM.

#### Minor Notices.

THE APPEARANCE of Part II of Farlow and Seymour's provisional host-index of the fungi of the United States will be warmly welcomed by the large and ever increasing number of students in this field of botany. This part includes the Gamopetalæ and Apetalæ, and the remainder of the work is promised in November, for which third part botanists are urgently requested to report errors or omissions in the parts already issued. The value and accuracy of the work need no commendation when one remembers the unrivaled facilities at the command of the authors. A glance through the well-printed pages also demonstrates the appalling amount of synonymy that a mycologist is compelled to face.

DR. CHAS. E. FAIRMAN has issued a paper on the fungi of western New York, being the first of a set of contributions to the mycology of that region that the author proposes to issue. He has been collecting for several years in Orleans county, and has collected over 425 species. The present paper gives a general discussion of the fungi of his region, and lists 30 species (with two plates) as representing the new species and varieties which he has added to the mycologic flora of western New York.

AN INTERESTING paper on the "History of Botany," read by Dr. T. J. W. Burgess before the Hamilton Association of Canada, has been printed in pamphlet form.

DR. N. L. BRITTON has laid botanists under obligation to him by preparing so complete a list of state and local floras of the U. S. and Brit. Amer. as the one just issued as "Contributions from the Herbarium of Columbia College, no. 14." So many of these lists are ephemeral or buried out of sight that it is a great boon to have them all together in one handy pamphlet.

MR. THEODORE HOLM, of the U. S. National Museum, has published an interesting paper on "The leaves of *Liriodendron*," appearing in the Proc. U. S. Nat. Museum. The great variability of the leaves of *Liriodendron* is well known, but Mr. Holm detects a certain regularity in the midst of all this variation, dependent upon position. He discusses the subject fully, with the help of 6 excellent plates, in the preparation of which the author is a master, and then applies his results in the consideration of fossil forms. It is just such studies that must be of immense service to paleobotany.

THE REPORT of the chief of the section of vegetable pathology for

1889 not only shows most commendable industry, but also contains valuable material. The report discusses the publications and correspondence of the Section (now Division); its field work, consisting of the treatment of grape diseases and those of the apple, pear and quince, treatment of blackberry rust, of the potato, tomato and melon for blight and rot, and of strawberry leaf-blight; conclusions concerning the practical work of the Section; laboratory investigations; investigation of peach yellows, by Dr. Erwin F. Smith and Prof. T. J. Burrill; the California vine disease, studied by Mr. Galloway himself in a most painstaking way, as we happen to know; and a mignonette disease, described and most handsomely illustrated by Mr. D. G. Fairchild.

THE REPORT of the chief of the Forestry Division for 1889 contains a great amount of information that has been collected from all quarters. The topics treated are as follows: Forest economy, forest technology, forest biology, irrigation, seed and seedling distribution, timber culture act, osier culture, forestry interests in the U. S., export and import statistics, proposed work, and influence of forests on water supplies. The last named topic is the prominent one, and will repay careful reading.

THE REPORT of the botanist of the Nebraska State Board of Agriculture for 1889 is a valuable document, as might be expected when it is known that the botanist is Dr. Charles E. Bessey. The first part of this pamphlet of 162 pages is a report on the grasses and forage plants. This is Dr. Bessey's work, assisted, of course, by his associates. The second part is a catalogue of the plants of Nebraska, by Mr. H. J. Webber, a most welcome addition to our list of state floras, and one which would have materially helped the Manuals if it had been published sooner. Some 1,872 species and 730 genera are enumerated, but the list begins with *Phytomyxa* and ends with *Vernonia*. Although botanical interest should concern itself chiefly in learning what plants grow in Nebraska, botanical attention will largely be given to the sequence of the groups. Dr. Bessey's well known opinion that one should begin at the beginning, has here a chance to express itself, and so, as the pages are turned over, one finds himself climbing up the ladder instead of backing down. When Phanerogams are reached (*Anthophyta*, they are called), Luer's arrangement of families is followed, but a good index enables a botanist to find his way. The fact is, it is a good plan to "try on" the various proposed arrangements in this way and see how they fit. Any new arrangement looks outlandish at first, but that is no argument against it. The summary of groups is as follows: 39 Protophytes, 95 Zygomycetes, 20 Oophytes, 691 Carpophytes, 47 Bryophytes, 17 Pteridophytes and 981 Anthophytes.

THE SECOND part of "West American Oaks" has been published, containing 13 full-page plates, which are a decided advance upon those of the first part. The prefatory note briefly expresses the relation of this part to the first somewhat as follows: Upon the publication of the first

part, Mr. James M. McDonald (to whose generosity the whole work is due) was impressed with the necessity of further examination of the new species and varieties mentioned therein. These had not been known to Dr. Kellogg. Accordingly, Professor Greene volunteered to give his summer vacation to field work in the Sierra Nevada and in the Rocky Mountains of Colorado and Montana. The present part contains the results of these fresh investigations.

THE SIXTH fascicle of Castillo's "*Illustrationes floræ insularum maris Pacifici*" has appeared, a most elaborate work. The present fascicle contains no plates, but those that have appeared are of exquisite workmanship. Accompanying this part is a pamphlet by the same author, discussing the flora of Polynesia and its relation to that of neighboring countries.

THE FOREST FLORA of New Zealand has been admirably illustrated and described in a recent work by Mr. T. Kirk.<sup>3</sup> It was prepared and published by the direction of the colonial government, and is a monument to the liberality and wisdom of the government, and to the scientific and economic knowledge of the author. The large plates are admirably drawn, and are accompanied by from 2 to 5 pages of text, giving a technical and popular description of the species. Much attention has been given to the economic importance and the best ways of utilizing the different woods, and also to the proper use of common names for distinguishing the various kinds.

THE FIRST volume of the *Muscologia Gallica*<sup>4</sup> is now complete by the issue of the ninth part, including the last of the Acrocarpi. The subscribers receive at the same time a reprint of the first ten plates, which were badly printed when issued. The title page and preface are accompanied by an analytic key to the genera included in the volume. The second volume, embracing the Pleurocarpi, will be completed in five parts.

DR. JULIUS RÖLL, in a paper on the Acutifolium group of the Sphagna (published in the *Botanisches Centralblatt*—nos. 21-25, 1890—also reprinted), makes a strong, and in some parts almost a savage attack upon Warnstorff's work of this title which appeared some time ago. Without attempting to judge the cause at all we greatly deprecate such criticism, which only produces or intensifies hard feeling.

ANOTHER PAPER on the Sphagna is by C. Jensen, who describes the Danish species in the volume of memoirs published by the Botanical Society of Copenhagen in celebration of its semi-centennial. The Latin phrase *tot homines, quot sententiæ* is certainly true of the sphagnologists. Every writer has his own set of species which he recognizes, and he calmly relegates the others to the list of synonyms. Each "raiseth up

<sup>3</sup>Kirk, T. The forest flora of New Zealand. Imp. 8°. Wellington, 1889. pp. 345, pl. 142.

<sup>4</sup>HUSNOT, TH.—*Muscologia Gallica*. livr. ix, 8 vo. pp. i-viii and 257-784, pl. 69-79. The author: Cahen par Athis, Orne, France. 1890. fr. 5.—Vol. 1, fr. 45.

one and putteth down another" in truly regal style, until the amateur can hardly tell whether his plant should be called a species, a sub-species, a variety, a sub-variety, a form or a sub-form. However he will be helped to know what this writer means by the six plates of details which accompany the monograph.

## OPEN LETTERS.

In reference to "biology."

[The following has been received from a "prominent zoologist."]

So there is trouble in the botanical camp. The wicked zoologists have been taking more than their share and a "prominent botanist" accuses them in the September GAZETTE of lack of philological lore, of common honesty or of even worse crimes. He even insinuates that zoologists are ashamed of the word zoology. All because they claim to teach biology. My memory is not very long, but it runneth back to a time when the boot was on the other leg. Then biology was never heard of. Instead we had the college curricula with their natural history courses, composed solely of botany and geology. There was indeed the college museum with its leather sided animals and its rows of impaled flies and other winged tortures, but aside from this the existence of the animal kingdom was not recognized within college walls except in the Sunday dinner at the college boarding house. I repeat, biology was then unknown—not only the name but the very thing itself. Was aught of *βίον* seen when reading those dismal and dreary papers constituting a Glossary of Botanical Terms? Did the student learn anything about *life* while trying to separate *Thalictrum* from *Anemone* or trying to unravel the snarl of the Asters and Solidagos? I ween not. Life and biology—a discourse on life—made its first appearance in the minds of the students when zoology lebowed its way into the curriculum. It was not until the living Amœba (the animal is not a myth) thrust out its pseudopodia right in the very face of the student, not until the action of the frog's heart was studied by every pupil, that biology came in. Zoology brought the impetus and the idea and in many a college where the botanist still goes his weary round of finding out whether the *ovule* is *orthotropous* or *anatropous* and of looking at the placentation of the ovule, all study of *life* is still left to the zoologist. Why should not he claim the word biology?

### Protective resemblance in Cassia.

I am in a sandy region abounding in *Cassia Chamæcrista* and *C. nictitans*. Did any body ever notice the protective resemblance of the pods to the *closed* leaves? It is especially marked in *C. nictitans*. Here the leaves when blown by the wind, or touched, close the leaflets upon the rhachis, and then appress the entire leaf upon the main plant axis. The pods, with their lomentaceous tendency, bear a striking resemblance to these closed leaves, and are similarly appressed. In *C. Chamæcrista* they are divergent, as also, to a degree, are the leaves. Often I have been at first deceived, as to the fruiting condition of these pretty plants. Again, a yellow spider on *C. Chamæcrista* is amusingly like the flower.

Buttonwoods, R. I.

W. W. BAILEY.